WHAT IS CLAIMED IS:

1. A thin film forming method, comprising the steps of:

employing a surface of a substrate as one electrode and disposing the surface of the substrate in a distance d (cm) apart from another electrode in a discharge space in which there are positioned at least a pair of electrodes connected to an RF power source;

introducing a gas containing one or more silicon compounds and hydrogen into the discharge space;

setting the product Pd of a film forming pressure P (Pa) and d and hydrogen flow rate M (SLM) so as to meet the relation:

$80M + 200 \leq Pd \leq 160M + 333$; and

applying RF power to generate a plasma and to form a non-monocrystal silicon thin film on the substrate in the discharge space.

2. The thin film forming method as set forth in Claim 1, wherein said product Pd and flow rate L (SLM) of a gas mixture comprising said gas containing one or more silicon compounds and hydrogen are set so as to meet the relation:

$67L + 200 \leq Pd \leq 147L + 333$.

3. The thin film forming method as set forth in Claim 1, wherein said distance d lies in a range of 0.5

to 3 cm.

4. The thin film forming method as set forth in Claim 1, wherein said hydrogen flow rate M ranges from 500 sccm to 10000 sccm.

5. The thin film forming method as set forth in Claim 1, wherein a flow rate of said gas containing one or more of said silicon compounds ranges from 10 sccm to 1000 sccm.

6. A thin film forming method, comprising the steps of:

employing a surface of a substrate as one electrode and disposing the surface of the substrate in a distance d (cm) apart from another electrode in a discharge space in which there are positioned at least a pair of electrodes connected to an RF power source;

introducing a gas containing one or more silicon compounds and hydrogen into the discharge space;

setting the product Pd of a film forming pressure P (Pa) and d and the ratio M/V of hydrogen flow rate M (SLM) to volume V (cm^3) of the discharge space so as to meet the relation:

$4 \times 10^5\ dM/V + 200 \leq Pd \leq 8 \times 10^5\ dM/V + 333$; and

applying RF power to generate a plasma and to form a non-monocrystal silicon thin film on the substrate in

the discharge space.

7. The thin film forming method as set forth in Claim 6, wherein said product Pd and flow rate L (SLM) of a gas mixture comprising said gas containing one or more silicon compounds and hydrogen divided by said volume V (cm^3) are set so as to meet the relation:

$$3.3 \times 10^5 \, dL/V + 200 \leq Pd \leq 7.3 \times 10^5 \, dL/V + 333.$$

8. The thin film forming method as set forth in Claim 6, wherein said distance d lies in a range of 0.5 to 3 cm.

9. The thin film forming method as set forth in Claim 6, wherein said hydrogen flow rate M ranges from 500 sccm to 10000 sccm.

10. The thin film forming method as set forth in Claim 6, wherein a flow rate of said gas containing one or more of said silicon compounds ranges from 10 sccm to 1000 sccm.